



COURSE: Advanced Mathematics		
DEGREE: Estadística y Empresa	YEAR: 2	TERM: 1

WEEKLY PLANNING									
WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	Indicate YES/NO If the session needs 2 teachers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	Introduction. Preliminaries				No	Introduction. Basic concepts and problems to be solved	1,5	7H
1	2	Complex Numbers				No	Study: Complex numbers, Arithmetic, Graph Polar and Exponential Form and Roots	1,5	
2	3	Summations and Products				No	Study: Summations, Products, Indexed Sums.	1,5	7H
2	4	Problems and exercises Series of functions I:				No	Do exercises in Problem Sets: Complex Numbers and Summations and Products	1,5	
3	5	Series of functions I:				No	Study: Numeric series, Telescopic Series, Geometrical Series, Convergence Criteria.	1,5	7H

3	6	Problems and exercises				No	Do exercises in Problem Sets: Numeric Series	1,5	
4	7	Series of functions II				No	Study: Powers Series, Taylor and Maclaurin Series.	1,5	
4	8	Problems and exercises				No	Do exercises in Problem Sets: Powers Series	1,5	7H
5	9	Series of functions III				No	Study: Trigonometric Expansions, Fourier Series.	1,5	
5	10	Problems and exercises				No	Do exercises in Problem Sets: Fourier Series	1,5	7H
6	11	Integral Transforms I				No	Continuous assessment: Control #1 (45 min) Study: Improper Integrals. Convergence Criteria	1,5	
6	12	Problems and exercises				No	Do exercises in Problem Sets: Improper integral	1,5	7H
7	13	Integral Transforms II				No	Study: Laplace Transform, Definition, Properties.	1,5	
7	14	Problems and exercises				No	Do exercises in Problem Sets: Laplace Transform	1,5	7H
8	15	Integral Transforms III				No	Study: Fourier's transform, Definition, Properties,	1,5	
8	16	Problems and exercises				No	Do exercises in Problem Sets: Fourier Transform	1,5	7H
9	17	Numerical Issues: Errors				No	Study: Numerics Errors, Sources, Types. Floating Point Arithmetics	1,5	
9	18	Numerics issues: Calculus				No	Study: Newton Method and Trapezoidal Rule. Introduction: homework deliverable #1	1,5	7H
10	19	Matrix Calculus I				No	Continuous assesment.: Control #2 (45min) Study: Funtions of matrices. Definitiion, properties. Exponential Matrix,	1,5	
10	20	Problems and exercises				No	Do exercises in Problem Sets: Functions of matrices	1,5	7H
11	21	Matrix Calculus II				No	Study: Integrals and Derivatives with scalars, vectors and matrices. Definition and properties.	1,5	
11	22	Problems and exercises				No	Do exercises in Problem Sets: Derivatives and Integrals.	1,5	7H
12	23	Singular Value Descomposition I				No	Study: Singular Value Descompotition. Definition of singular values, SVD Methodology. Application.	1,5	
12	24	Singular Value Descomposition II				No	Study: Pseudoinverse (Moore-Penrose)	1,5	7H
13	25	Problems and exercises				No	Do exercises in Problem Sets: Singular Value Descomposition	1,5	7H

13	26	Singular Value Descomposition III				No	Study: Introduction to Principal component analysis	1,5	
14	27	Numerical Issues: Linear Algebra				No	Introduction: - LU factorization -Power method for approximating eigenvalues. Indicate the way to do the homework ENTregable #3	1,5	7H
14	28	Continuous assessment	X			No	Continuous assessment: Control #3	1,5	

Subtotal 1 **42** **98**

Total 1 (Hours of class plus student homework hours between weeks 1-14)

15		Tutorials, handing in, etc						10	
16		Assessment						3	
17									
18									

Subtotal 2 **3**

Total 2 (Hours of class plus student homework hours between weeks 15-18)

TOTAL (Total 1 + Total 2. <u>Maximum 180 hours</u>)								150
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